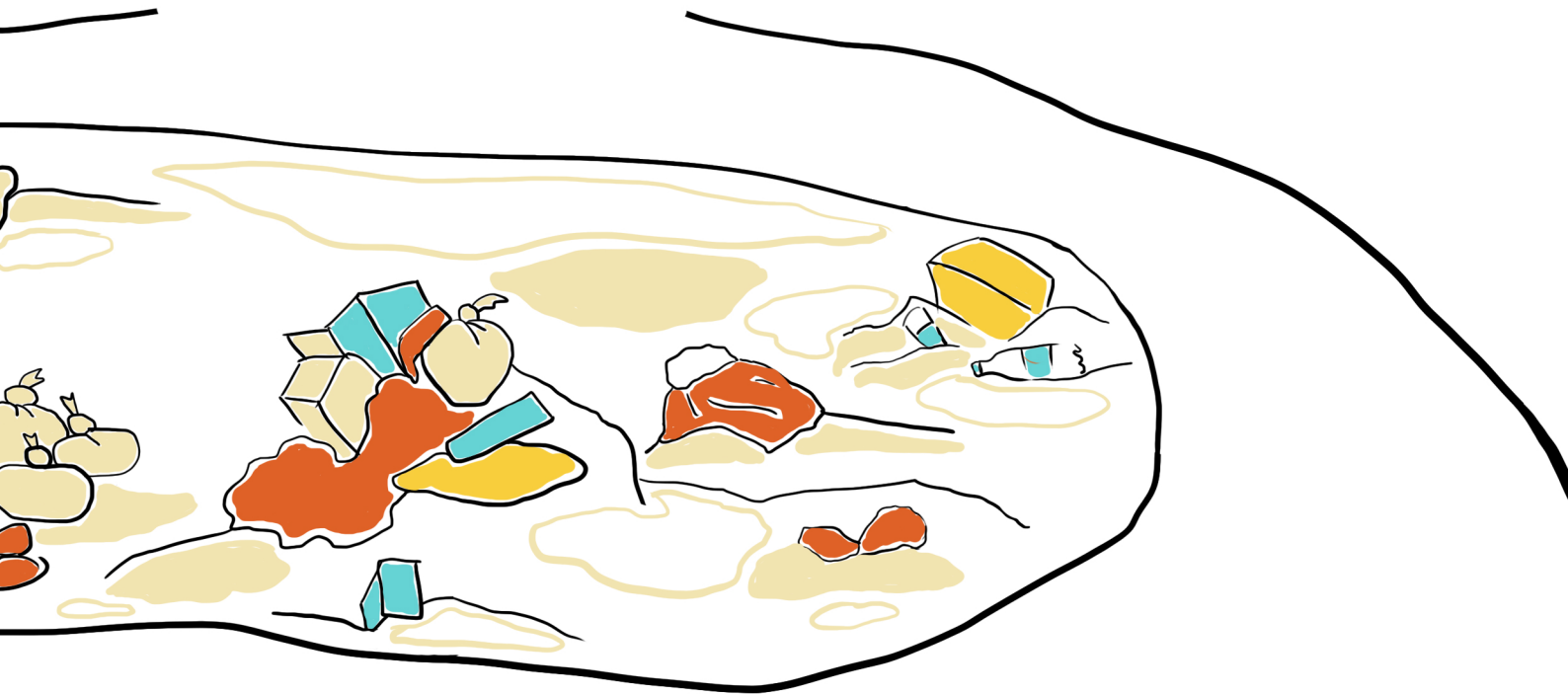


Himalayan Paradise or **Dumpster?**

Ethnographic study on the phenomenon of trash flows in the village Bir, Himachal Pradesh.



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Master's Thesis, 2018

Aalto University Art and Design

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Department Design		
Degree programme Collaborative and Industrial Design		
Year 2018	Number of pages 74	Language English

Abstract

India faces major environmental challenges associated with waste generation and inadequate waste collection, transport, treatment and disposal. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and this impacts on the environment and public health. Even in a small countryside town like Bir, Himachal Pradesh trash seems to have become an annoyance. This quaint small village over the last 5 years turned into a bustling tourist destination which brought in diverse communities from all of India and the world. While there was no waste management system in this village, the small community burnt and decomposed their trash. With a rising population there is a rise in trash as well, turning the village into a potential dumping zone. The local government has failed to put a system in place and the community efforts are not impactful on a large scale.

This thesis investigates the current problems of waste dumping in the small town Bir. The ethnographic research focus delves deep in the journey of trash in the village and its causal relationships. Through ethnographic visual study, in depth interviews with the diverse stakeholders of the village the multiple facets of this problem were understood. Through in depth analysis and synthesis it was concluded that the complex problem of trash in Bir comes from not just the irresponsible dumping of trash due to the lack of a system in place. It was also a lack of active synchronization between different stakeholders. While the activists of the community tried to deal with this problem through alternative living , the neutral locals ignored the problem. The governments shift of focus towards economizing sports and tourism left this problem to become colossal. This thesis focuses on creating design implications for several important stakeholders and for evolving pathways that help overcome this problem through synchronised efforts.

Keywords System Design, Service Design, Ethnographic Research, Waste Management

ACKNOWLEDGMENTS

I would like to Acknowledge all the people who were a part of my experiences in Bir, Himachal a few years back. The place and community took to me and pulled me back to work for it years later, today. As much as it was a short sprint, this Thesis is very close to my heart and it taught me a lot.

I would like to thank the University for introducing me a more empathic and impactful way of working towards problems. It took time to unlearn what was a very commercial way of using my design skills to very complex and impact problems. Working on a global issue like Waste Management was challenging but the learnings from all the courses I took up at the university contributed at to tackling the challenges step by step in the process of my thesis.

I would like to thank my Supervisor Turkka Keinonen, for being supportive about my very adventurous and impulsive approach towards my Thesis. His honest and practical approach helped me take quicker and crisper decisions in the process.

I would sincerely like to thank my Advisor Yiyang Wu. This thesis would not have been complete without her. Her positive approach towards how to deal with deadlines and the decorum of thesis in general helped me look at my thesis as an experimenting platform for the things I learnt at the university. She worked on my thesis with me and helped me spot patterns which I was blinding myself to. I thank her for her calming words, she is an advisor everyone should have. I would also like to thank her for recommended me for the Design Grants, if it wasn't for her I would not have received it.

I would like to thank my Expert Advisor Arvind Lodaya. While his presence in my thesis was short, same as my timeline. Each of his advice was fruitful for improving my project. I thank him for his detailed and critical feedback and his passion at aiming for the sky.

Finally i would like to thank my family and friends for their calm support throughout the process. Their confident yet easy going approach helped me look at this thesis as yet another project which I could enjoy and finish to be able to look forward to other milestones

ABSTRACT

India faces major environmental challenges associated with waste generation and inadequate waste collection, transport, treatment and disposal. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and this impacts on the environment and public health. Even in a small countryside town like Bir, Himachal Pradesh trash seems to have become an annoyance. This quaint small village over the last 5 years turned into a bustling tourist destination which brought in diverse communities from all of India and the world. While there was no waste management system in this village, the small community burnt and decomposed their trash, with a rising population so is the trash, turning the village into a potential dumping zone. The local government has failed to put a system in place and the community efforts are not impactful on a large scale.

This thesis investigates the current problems of waste dumping in the small town Bir. The ethnographic research focus delves deep in the journey of trash in the village and its causal relationships. Through ethnographic visual study, in depth interviews with the diverse stakeholders of the village the multiple facets of this problem were understood. Through in depth analysis and synthesis it was concluded that the complex problem of trash in Bir comes from not just the irresponsible dumping of trash due to the lack of a system in place. It was also a lack of active synchronization between different stakeholders. While the activists of the community tried to deal with this problem through alternative living, the neutral locals ignored the problem. The government's shift of focus towards economizing sports and tourism left this problem to become colossal. This thesis focuses on creating design implications for several important stakeholders and for evolving pathways that help overcome this problem.

CONTENTS

1. INTRODUCTION

- 1.1. Personal Motivation
- 1.2. Research Objective

2. PROJECT BACKGROUND

- 2.1. Indian Waste Management System : A colossal Failure
- 2.2. Governance : Policy play and interventions
- 2.3. Bir : The ignored town

3. RESEARCH METHODS AND PROCESS

- 3.1. Research Process
- 3.2. Research Methods and Tools
- 3.3. Why no quantitative analysis?

4. IN SEARCH OF TRASH : COMMUNITIES OF BIR

- 4.1. The Research Field Site : Bir Colony Road
- 4.2. Overview of the communities
- 4.3. Phenomenon of Trash Flows : The Neutral Community
 - 4.3.1. Open Illegal landfills
 - 4.3.2. Rain channels or Trash Channels
 - 4.3.3. The smoky hour of the village
- 4.4. Alternative Interventions : The Activist Community
 - 4.4.1. Birth of Activism in Bir
 - 4.4.2. The Current Interventions
 - 4.4.3. Impact of these Interventions

5. SYSTEMIC INSIGHTS ON ABSENCE OF SOLUTION & IMPACT

- 5.1. Analysis of the data gathered
- 5.2. Why is there no solution yet from the government?
 - 5.3.1. Shift of Focus
 - 5.3.2. Lack of expertise and tools
- 5.3. Why is there not a larger impact of communal interventions?
 - 5.3.1. Low knowledge on impact of alternative ways of living
 - 5.3.2. No communication channels or right platforms

6. PROTOTYPING : GIVING POWER TO ACTIVISM

- 6.1. Prototype
- 6.2. Why give power to activism?
- 6.3. Participatory Co-Design Workshop
- 6.4. Outcome of the workshop
- 6.5. Reinforcing Insights : Why was prototyping the cementing stage?

8. DESIGN IMPLICATIONS FOR EVOLVING PATHWAYS

- 8.1. Conclusion
- 8.2. Stakeholder Typology
 - 8.2.1. Implications for Entities
 - 8.2.2. Implications for the Activists and Neutralists
 - 8.2.3. System Map
- 8.3. Implications for a designer

REFERENCES

CHAPTER . I .

INTRODUCTION

This introduction is like a taste that triggers curiosity and tries to encapsulate the important milestones that the reader will be stepping onto while reading this thesis. The introduction includes both my personal motivation and the genuine aim behind doing this thesis.

1.1. Personal Motivation

I was working on commercial projects as a User Experience and Product Designer in India. When I started this masters the intent was to go back to research and strategy to solve more complex problems. Unfortunately the Role of a designer in India at them moment is leaned towards a more commercial profit making position. That is ironic, because India at the moment needs researchers and designers who can help solve more complex social problems. I was convinced that I wished to experiment with my learning at Aalto, to a problematic area in India.

I was passionate about actively contributing to a global issue like Waste Management. I chose to do this in a small village of a developing and my home country, India. I had to choose a small case study, which would suffice the timing of a Master's Thesis. A few years back, I was learning paragliding in a small Himalayan village. After involving myself with the community I realized there are complex problems that flow under the beautiful surface of the village landscapes.

At the moment there is no waste management system in place, in Bir Himachal Pradesh. Due to no door to door collection service, garbage goes into small landfills close to homes in the village. The beautiful flying village is turning into a landfill that homes waste from local homes, tourists and restaurant cafes. The government has loose policies on illegal garbage dumping, but there can be no penalization due to no alternative solutions for the community. The dumping and burning of garbage continues as of today, furthered onto a large scale due to urbanization, triggered by tourism and sport.

My personal motivation was to step into communities of Bir, to help bring impact through/with the role of a design, not by creating good looking solutions but by empowering and nudging the communities to be active.

1.2. Research Aim and Objective

By investigating the current ways trash journeys through the village of Bir, this research aims at evolving pathways that would act like nudges for the communities and government to act on the issue with synchronization. Waste management is a complex problem that has several causes affecting it from several perspectives. The stakeholders of this problem go from local communities, government

departments, key collaborative entities like wholesalers and producers who form a clockwork pattern that create this problem.

Current research around Waste Management systems has foci on investment in technology like waste incinerators for solid waste management in not just cities but small towns too. Incineration definitely proves to be a far away alternative from landfilling however it comes with its own grave disadvantages like high cost for pollution control, difficulty in monitoring emission of gasses, need for tight policies, removal of hundreds and thousands of jobs from just the collection and sorting of waste outside and in landfills and absence of viable technology that deals with the bottom fly ash outcome [12]. While efforts are still being put in improving this technology, this direction is relatively easier than public campaigns to reduce and recycle. Even though, In smaller intellectual and activist communities in India, circular ways of living exist and concentration is more on meaningful consumption and recycling but they fail to have a large impact. The culture of alternative living and behavior change is very new in India and small scaled. For instance, the only town in India that has come up with the strategy of earning out of an alternative waste management system is Vengurla, in Maharashtra where even non-segregation is fined. While this is a good benchmark, to be able to get into a part agrarian village needed more than just a mission statement or a benchmark, as several perspectives ruled this complex problem.

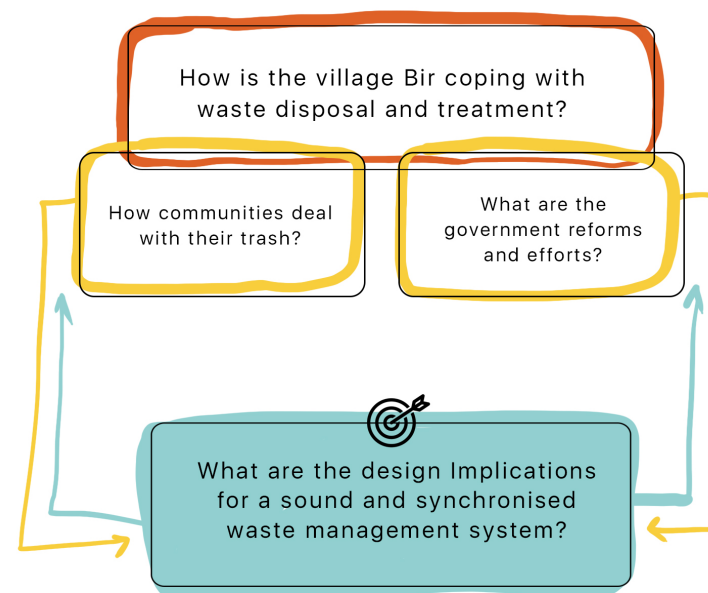


FIGURE 1. Research and Objective Diagram. (Mission Icon source : <https://the-nounproject.com/search/?q=aim>)

How is the village Bir coping with waste disposal and treatment? What design implications could be suggested for evolving pathways that encourage a sound waste management system?

With reference to Figure 1, the Objective diagram represents a starting objective acting as the umbrella understanding through sub objectives. The first objective investigates how the village Bir is coping the waste management system, through the lense of key trash flow phenomenon, governance status on this problem and what are the current efforts. These sub objective act as tributaries to a larger aim. The sub objectives would help bring about relevant implications for the evolving pathways for a sounder and synchronised waste management system.

CHAPTER . II .

BACKGROUND

Waste management problem is a global issue and in India is its one of the largest and complex issues. The problems of waste management in India come from deep rooted issues that branch into lack of comprehensive politics, conflicts and developments of waste management systems, lack of recycling and composting and education. While cities are most affected by production of high amounts of waste everyday in India, small towns are started to see evident trash sites too, due to rapid urbanisation through tourism. While cities still have some sort of system in place, small towns survive on their old ways and or no system.

2.1. Indian Waste Management System : A colossal Failure

India stands at the highest waste producing nations of the world right after the five leading trash generators, United States of America, China, Brazil, Japan and Germany [6]. India generates nearly 70 million tonnes of municipal solid waste a year, of which about 80 per cent is dumped without precautions in landfills. These landfills are toxic places that spew gases like dioxins and the greenhouse gas methane for a long time. Land is getting scarce as well, while waste generation is increasing rapidly [12]. Ramandeep Singh duly notes our failures in preserving the natural wealth as the metropolitan city New Delhi burns its largest landfill every other day, making it a major contribution to the air pollution crisis [5]. Current systems in India cannot cope with the volumes of waste generated by an increasing urban population, and this impacts on the environment and public health [1]. At the moment India does not have the knowledge and capability of recycling and composting due to high moisture in mixed waste, even though if done right it could prove to be very beneficial as 50% of India's trash is organic waste [12].

According to experts the waste management system in India is barely close to what will take us to a clean nation. India has five major cities which practice a waste management system that is very different from the rest of India which 80% small villages and towns.[1] At the moment in most cities, collection of Solid Waste at household level is done by using methods such as door-to-door collection or collection from community bins to prohibit littering and proper collection of MSW. It is observed that the major issues related to collection of MSW are lack of awareness and lack of adequate manpower for door to door collection, which affect small towns and villages more than cities. [3]

Every Indian town has at least one specific area earmarked as a landfill area. The collection process begins with contractors employed by government bodies performing door-to-door collection services covering all households, scouring for any recyclables that may fetch a market price and later transporting all remaining waste to landfills. [2] Largely populated cities and towns have well defined system for MSW collection, transportation, and disposal/composting. The community bin collection system or door to door collection is the main practice. In this system, residents deposit their waste into the nearest community bins located at street corners at specific intervals [3]. The collected trash is taken by trucks, transferred from community bin to sanitary landfill site allotted to the town [3]. Segregation is not prevalent in the homes

or the neighborhoods. The trash is collection in form of mixed solid waste and then thrown into the landfills. In such a service system, the segregation, sorting and treatment of trash is entirely the burden of the municipality not the residents. There is a laid back or even a surrendering attitude towards the existing system where not much time or knowledge is imparted towards the problem of waste. Or in Asnani's words, and in his paper, lack of awareness about the processes and laws, at employment and citizen level, have created this chaotic system and therefore the laid back attitude of shifting the burden, having to deal with too much in urbanised metro cities [3].

Small towns and villages in India have less population and/or are agricultural economies. Urbanisation has not reached these villages as yet and these village mostly due to their lifestyle and affordability depend very little on packaged goods. Due to this smaller quantities the garbage is generally dumped and burned openly. Solid waste management is given low priority and budget and infrastructure and sanitisation is given a larger agenda, which shifts the focus from waste management and decision-making process becomes slow[4]. There is also very little literature produced about small villages and their waste problems. However, once these areas grow economically and commercially the plastic and eventually the waste management problems start propping up. What was not a problem before, becomes an even bigger problem as the village is not ready for it. This is currently the situation in Bir, the case study town of this thesis.

2.2. Governance : Policy play and interventions

In the year, 2014 Narendra Modi, after being elected Prime Minister made a noteworthy first step keeping sanitation to the top of the policy agenda under the flagship Swachh Bharat Abhiyan program - Clean India Dashboard. However, the short in focus of the program on toilet construction and eliminating open defecation deflects attention from colossal failures in waste management systems [5]. There is a lack of a designated body that has waste management as their prior focus. At present. Trained personnel in Solid waste management and the availability of qualified waste management professionals are limited[1][7]. Municipal authorities are responsible for managing MSW in India but have budgets that are insufficient to cover the costs associated with developing proper waste collection, storage, treatment and disposal. The lack of strategic MSW plans, waste collection/segregation and a government finance regulatory framework are major barriers to achieving effective SWM in India [1].

Ample amount of policies are passed however the essential problem is the lack of one comprehensive policies with it due noted governing bodies. What also makes the process of tedious is large amount of certifications required from the Central Pollution Control Board(CPBC) in order to implement them [2]. In 2017, the government strictly issued a policy on ban of plastic bags and a fine for penalty. This is being practiced in the cities well, however there is no record or penalties in small towns where plastic bags are still used.

What is interesting though is the raised concern on Environmental policies not doing enough justice to the waste management issues. Current policies and rules on urban waste suggest waste is seen solely as an environmental policy issue [9]. Policies focus on specific aspects of the management of urban waste (collection, segregation, storage, treatment, and its disposal by different agencies), prescribing standards for treatment and its disposal, regulation of these standards [9]. There is a gap between the policy formulators and the implementers. For instance, the ministry of environment, forest and climate change reviews and formulates the policies for the MSWs. These policies are further implemented by the Urban Development departments [11]. This disconnection between the two stakeholders leads to different levels of understanding of the waste management problem and there is lack of stakes and ownership in policy implementation[9][10].

There are multiple schemes of people's participation in the process of policy formulation, project development and implementation. On the basis of 74th Amendment of the Constitution, the elected representative of the people (in the case of metropolitan cities) is entitled to represent people's voice in the process of policy formulation and implementation. However it has been observed that often the elected Municipal Councilor after getting elected enjoys the power by overlooking its responsibilities. There should be a mechanism of making the elected representative accountable of its duties. [8] In small towns like Bir audience is diverse with varied lifestyles and participating in policy formation process would be beneficial for better implementation.

2.3. Bir : The ignored town

Bir is a small town in Himachal Pradesh, famous for being the Paragliding capital of India and the retreat and buddhist culture. With internationals, nationals and tourists coming in fulfill their dreams of flying this valley also offers meditation retreats and Buddhist monasteries, several tea estates, elaborate organic farms, paragliding courses, bohemian cafes and visible trash. Till the early 1990s, the village of Bir was mostly an agrarian economy. The locals and communities of Bir depended on farming as a source of earning and the local produce as the food they ate. However with the sport and meditation retreats bringing in an influx of international and local tourists spurred new economies and commercial businesses to profit from the tourism. While the local farmers still maintain their way of living new communities with sportsmen and students come with a different perspective.

In 1995 for the first time, Indian army discovered this destination as a good place to practise hand gliding. The local government encouraged the sport and called in for competitions. In my interviews with several known stakeholders of the communities, the locals participated in the sport however the time when the sport actually picked up was in 2005, the first time Bruce, the first paraglider of Bir, brought in sport to the valley. Paragliding flourished the village of Bir and became the talk of the state. The village got a lot of recognition for the sport and its tibetan monasteries. Thereafter, sport and retreat got in nation and international visitors all year round. Between 2005 - 12, several commercial hotspots came up to entertain the sportsmen and international buddhist/retreat students.

Narendra Modi was elected Prime Minister of India and he started a movement called "Swachh Bharat Abhiyan - The clean India dashboard" which provided guidelines and funding to all towns of India instructing them to do a mass clean up and come up with waste management strategies. Followed by the movement, not much change was seen in the four years and trash continued to dive deep into the channels, landfills and air of the village. In 2017, another large appeal was made by the local governments together, to finally come up with some solution as there were a rise in complaints by the locals of Bir.

However, smaller communities of Bir, activists like the certain cafe owners and NGOs continue to put in efforts to create meaningful lifestyles. For instance, using local produce to run the cafe rather than buying plastic bottles and tetra packaged products. Passionate and consistent visitors of the valley along with the activist cafes like Silver lining cafe started a project called the wall project, which was art installations of cement and eco bricks, this way the plastic bottles will be reused, however larger amounts would be dumped into the rain channels.

At the moment there is no door to door collection of garbage in the valley, as there is no landfill allotted to the valley by the government. The valley as mentioned before was majorly practicing composting and using the compost for farming, burning the rest of the solid waste and dumping the medical/unhygienic waste in the land which would be buried later. Now with the increasing number of tourists bringing in new economies, plastic is a common sight in the valley, along with other solid waste like tetra packs and glass bottles. During sport season, which is 8 months a year, the valley is filled up with tourists and waste making it a potential landfill which is a product of careless leisure and no waste management planning. With the problem becoming worse, the government pushed the agenda of a already demanded landfill for the village around 8 years ago. The government denied the landfill as the area surrounding the village came under forest government who did not approve their request. Till this date apart from temporary interventions and trials no permanent solutions has been implemented to solve this problem. In the recent Urban Development Plan, The Vision 2035, talks about the problem of waste management. The report talks very few facts about the current situation in the village, with loose ends. They also caters to the problem with upper level interventions and does not show in depth implementation strategy which is what the village needs [11].

Today, a suitable landfill site is in route to be chosen. The state government is in talks with the technology providers from Hyderabad to invest in a large incinerator for the several villages in and around Bir. While this raises the hopes of the local government and locals of Bir, the trash continues to pile on, knowing not exactly how and when will the solutions prosper.

CHAPTER . III .

RESEARCH PROCESS & METHODS

In the month of July, August and September, ethnographic research was conducted in the village of Bir. This was divided in two sprint each of which lasted around three to four weeks each. The idea of the sprint was to dive into the community in the process of understanding a complex problem like waste management system. While the targeted area appeared to be a touristic section, there was a large mix of communities going about their day. In order to understanding the state of affairs, it took a great deal of strategic planning to focus on gathering data about the issue from these different communities. This chapter of the book demonstrates how the research was strategized.

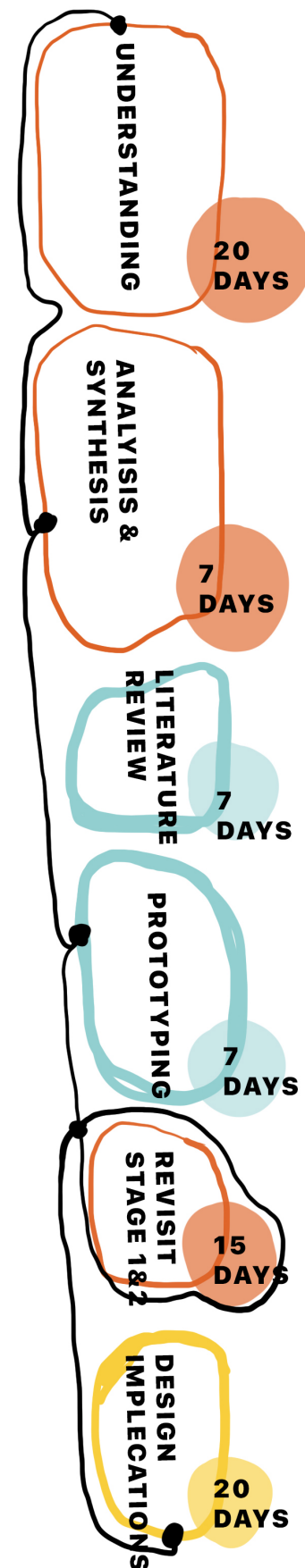
3.1. Research Process

Waste management is a complex and deep rooted problem. A linear and solution oriented approach may only cater to a small speck of the problem. In this project, during the ethnographic research it was realized that, a rather deviated and back casted way of working was more beneficial and reinforcing way of working.

The initial process was a commercial step by step synthesis which started from Research, analysis, ideation and finally prototyping. However in a short sprint, focusing on the first two stages turned out to be more beneficial. Waste management problem is also multiple leveled problem. For instance, it is not a problem only policy change can solve. Rather holistic system change, where multiple bodies of the system, for instance diverse communities, governmental bodies, service providers and more contribute in harmony. For such a problem, it was meticulous to first involve all these bodies to find problematic patterns and then design multiple directions for each.

Therefore, for a multileveled problem like this, it was important to have a multi leveled research framework. As you can see in Figure 2. the timeline represents a not so linear process. The timeline bends with the process. For example, research phase propped up more than once in all the stages of the thesis process. The process started with the understanding of the waste management system with foci on three objectives : Why is their trash on the road? Why is there no solution? Why are the current interventions not effective? The understanding phase, involved visual study, ethnographic shadowing, in-depth interviews and living with the community for, in total, two months divided across the timeline in sprints. As it is seen in Figure 2. The parallel columns also show tools used and stakeholder involvement. While a very simple flow of understanding, analysing, ideation and prototyping would be what all designer tend to lean towards, but this thesis demanding revisiting understanding and analysing to reinforce insights and form final directions.

The Analysis and Synthesis phase was based on finding patterns out of the research done in the first phase. The analysis was done using two methods, one was pattern finding through board mapping. The observations and interviews were laid out on a big surface so as to bring out findings, stakeholder patterns and way forwards.



The idea after the analysis and synthesis would have been to use the insights bring about feel good ideas which could be prototyped. There was no better way to do this but through a role play workshop with the activists of the communities. The activists of the communities were the ones who showed initiative towards bringing change in the village of Bir. The co design prototyping workshop proved to be an efficient form of platform to reinforce insights. It also helped realise, going forward not ideas but implications and directions were the emergent need. This was a point where the process took a curve towards the phase understanding to bring about narrowed and contextual insights. The following section explains each method in a crisper more detailed form.

3.2. Research Methods and Tools

1. Ethnographic Study

Ethnographic study is a type of study that involves in depth understanding of groups and people (in this case communities of Bir), their behaviors and belief systems. The study could involve studying the personal and social behaviour, aspirations and beliefs of the different communities. In case of Bir, ethnographic study suited best due to the diverse communities that duelled in the village. Locals were an equal yet invisible part of the village, the other communities like commercial businesses, sportsmen and retreat community were the visible ones walking around.

Observation : Visual Study

Observation (in form of ethnographic research) is a part of the very first stage Understanding. Observation was the first method i used when i entered the field. Since the village of Bir is big for one student researching the entire village, would be next to impossible in a short sprint. Therefore, a field demarcation was first done to be able to grasp the trash flows visually. I used google maps and my past knowledge to demarcate the field of research in the village. The field selected was the famous tourist road which was a gateway to the village Bir. This road comprised of not just new economies but local homes, sports and tourism. All communities practically merged onto this colony road.

I used 7 days of walking around, mornings and evenings to understand in detail, visually, where all the visible trash spots. Visual study through observation was to also understand the patterns of why trash spots were in the certain areas. I would use every night of those 7 days to document the data i collected.

The data collected through the 7 days was in form of pictures, videos and field notes. The field notes contained questions, observation scribbles, doodles and small details like olfactory and vision data.

In Depth Interviews

Approximately 44-50 interviews were done in the first phase of understanding. While this method was a key way of gathering information directly from the members of different communities, it was also a way of understanding personal perspectives of the trash flow issue.

About 12-13 days were given to interviewing different members of the communities. These interviews largely included sportsmen, cafe owners, local farmers, tibetan locals, NGOs and the local government members. There were several ways I approached these stakeholders. Most tools involved calling the stakeholders directly through a known contact. Since I was a regular visitor of the village, the locals knew of me and were comfortable by the thought of being interviewed. Another way of approaching a few stakeholders were emails, especially the NGOs as they use to keep very busy with retreat students.

Each of these in depth interviews lasted from between 30 - 80 minutes. The interviews had phases of using a systematic way and using cultural probes like brainstorming and maps reference. The way the data was gathered was through recording of voice, pictures and majorly notes.

Shadowing

Shadowing was a part of analysis phase. While ample amount of information was collected, it was hard to find evidences as not much recording and documenting was done in the village. There were two ways shadowing was done in this project. One was politely taking the permission of a stakeholder and following them about their day and other way was sneaking and not being visible to the stakeholder. Sneaking was a large amount of shadowing done, especially to collect evidence of trash throwing.

Around 6-7 stakeholders of the community were shadowed in 7 days of a later stage. A short sprint of 2 minutes to around 30 minutes were used for shadowing. Data was gathered through pictures, asking questions and recording voice and field notes as observations.

2. Co-Design Workshop

Codesign or participatory workshops are done (especially in case of village Bir) to bring together active stakeholders in order to engage them to talk about the problems of trash flows and to come up with solutions together.

First the purpose of the workshop was outlines. The material, basic make do materials, were collected from a local stationery source. The plan of the workshop was made with materials ready. I tied up with a cafe, requesting them to allow us half a day at their vicinity, while tea and coffee were complimentary(paid by me). Around 14 stakeholder members were called to the workshop, however only 8 showed up. This was enough to work on 2 scenarios rather than 3 scenarios, each scenario came out of key insights brought out from analysis and synthesis.

I was delegating the workshop and acted as an audience without interfering or mediating. The workshops first phase was introduction inform of insights which i had gathered. This lead to a short discussion on trash flow phenomenon in Bir. The next step was to divide into groups and choose scenarios to work on and bring about a systemic solution. Finally, each team would present as though they were propagating their plans.

Data was gathered in several ways, one a video of 2 hours was taken, pictures were taken, notes were taken on conversation during discussions between team members and data was also gathered in form of documentation of feedback of the members on the workshop.

3. Board Mapping : Data Analysis

This method was chosen for the Analysis and Synthesis stage. The board mapping method was a process that last over a couple of weeks, as the board grew and more data was added onto it, as it was collected in order to reinforce the patterns and insights which would come out of the mapping.

First the qualitative data collected from the ethnographic research was narrowed down onto post-its and stuck on the board/wall in this case. When several layers of data was added, then categorisation of data was done. Over the categories a layer of patterns were pasted in form of post its, for instance where were influence flows coming from versus where were ignorance flows coming from. Insights were another layer that was added after pattern finding.

After the prototyping stage, the board mapping was revisited to reinforce some of the key insights which were developed. In this case another layer of final key insights were pasted, forming a board of synthesised data.

3.2. Why was there no Quantitative Research?

A quantitative analysis, in its true form, would have helped in tracking and understanding how the village could control or bring down the quantity of garbage from its source. There were several reason why this process was stopped right away. In the realization that, the waste in its nature was not the problem as much as the sheer existence of a waste management system. It turned out that it was more important to first devote time in understanding the why behind there being no system in place rather than how to control the trash flows, which was as important to understand.

What made the process tedious and time consuming was the non existence of recorded inflows and outflows of resource consumption by the cafes, restaurants, shops and homes. During the interaction with the stakeholders, it was difficult to gather an estimate of how much packaged and plastic products were the commercial stores buying for selling. Shopkeepers and grocery stores provided a small estimate however, the targeted area did not have a consistent way of stocking on products. While this analysis would have proved to a significant contribution to my thesis, it was tedious take up in a short time like this.

CHAPTER . IV .

IN SEARCH OF TRASH : COMMUNITIES OF BIR

While walking the research site you can see a silent pattern that exists on the two kilometer long tourist street, the pattern that the locals and visitors choose to ignore. Due to the non- existence of waste management system, the different communities of Bir have adopted trash throwing practices which are becoming visible in the village as days go by. While the local farms still believe in burning the trash and not littering, the businesses choose to ignore the consequences of throwing their trash in the rain channels. Smaller sectors of communities cope with this problem by forming their own small communal landfills, however more activist but small scale communities make effort to live in an alternative more circular way. This chapter encapsulates ethnographies of communities and their trash flows.

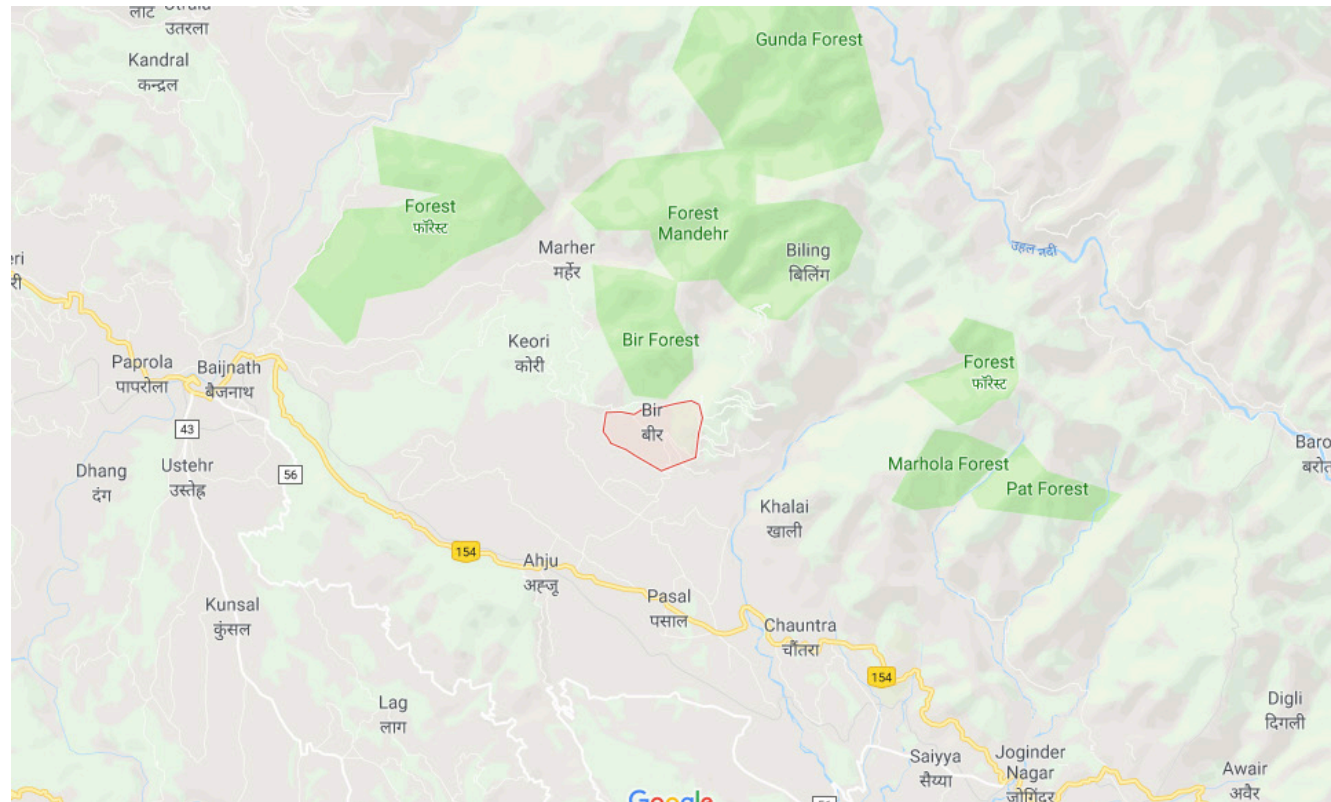
4.1. The Research Site : The Bir colony Road

Bir is a small village in the district Baijnath (Map .2.) which belongs to the adventure sports capital of India, Himachal Pradesh (Map .1.) . When you zoom in onto the map of the state Himachal Pradesh you can see a small village on the map, as you can see in Figure 8 and 9. While in comparison to all of India Bir is a small village, however it hosts around 6000 residents and that is a big focus. So in order to do significant and impactful thesis, I chose a particular section of the village, Figure 10. This section is one road, which opens the doors to the touristic part of the village. The road is a stretch of approximately two kilometers, which comprises of more than five types of communities living and walking about during the day.

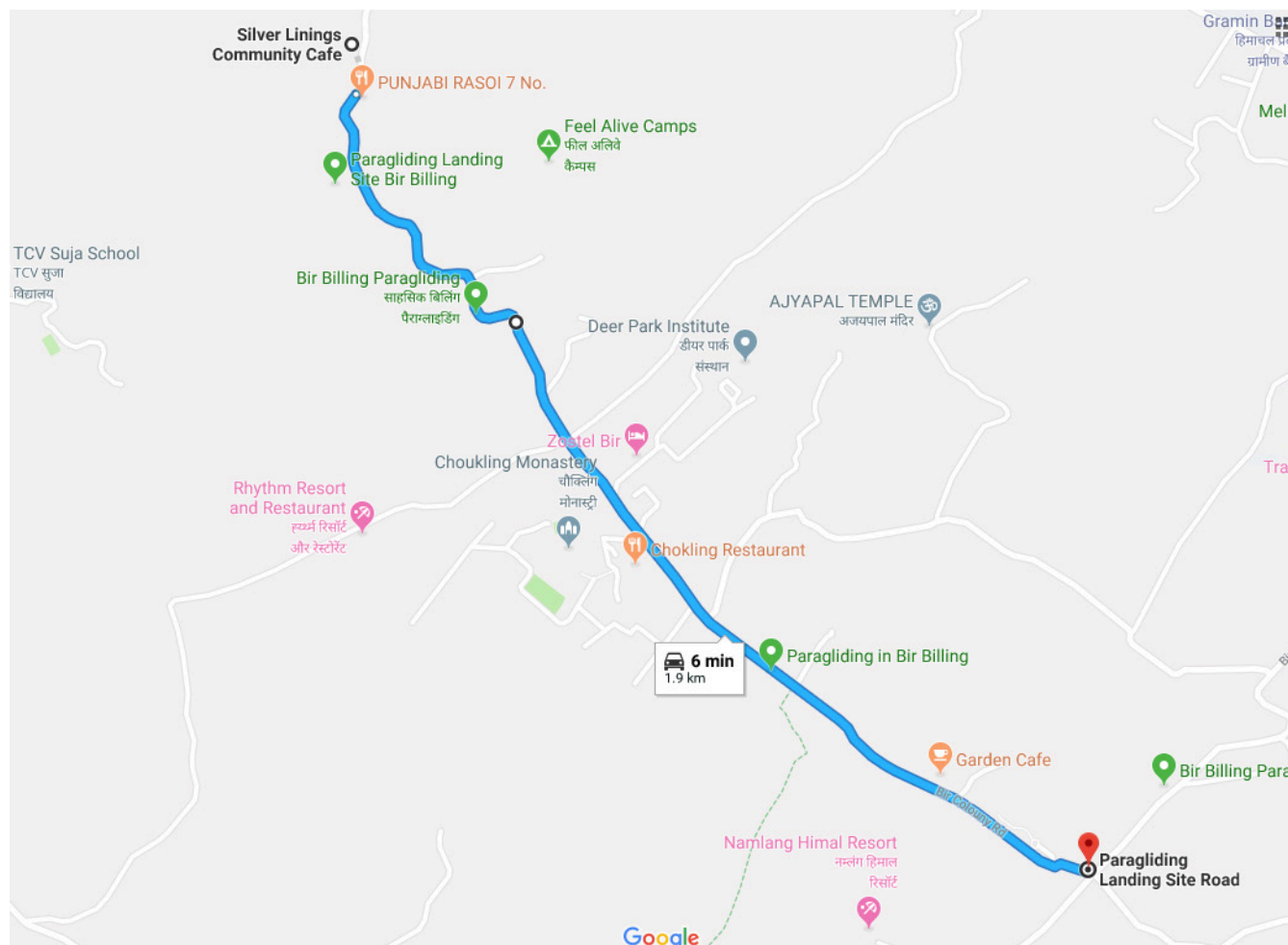
The Bir colony road takes the passengers and pedestrians straight to the paragliding site. Over the years, passenger flow grew and businesses started propping up on either side of the colony road, as it can be seen in Figure 10. For the towns and cities surrounding the village, Bir is a weekend destination. With over more than around fifty cafes and guesthouses, four local government offices, four tibetan monasteries and schools this small communities has everything at a stone's throw away.



MAP.1. Map of India, focusing on Himachal Pradesh, the state of agriculture and mountain adventure sports.



MAP .2. Map of Himachal Pradesh, zooming into the Tehsil, a small village called Bir, which is the field for researching.



MAP .3. The Bir Colony Road, the demarcated area which is focus area for the project

4.2. Overview of the communities

The small area (Map .3.) that makes the Bir Colony Road comprises of more than five communities. The local communities though are the locals which are the ethnic farmers and the tibetan settlements which migrated tibet in the 1860s. Both these communities stay in harmony with each other however prefer to stay closer to their communal nature. The sports men, paragliders and mountain sports men are national and international visits but are also local , as shown in Figure 3The cafe and the restaurant community comprises mostly of the tibetan and city migrants. They have opened their small business to welcome the tourists and earn money. The farms stay a little further from the commercial street of Bir colony, even though area wise this it might be very close, however they are hidden by the facade of the commercial businesses.

All the communities behave differently when it comes to the production of trash. Trash flows from local homes is much less in proportions to the trash flows from the businesses from the commercial bir colony road.

The most amount of trash is visible in and around the commercial area. While walking into the branches outside the commercial area, lesser plastic trash is seen however more smoke is seen. The later section explains this phenomenon. The way the communities deal with trash is separately. At the moment the Bir Tibetan Settlement, comprises of 200 homes and they flow their trash to one area. The cafes and restaurant follow each other and dump it in domino effect, wherever they find suitable. The local farmers however, burn their trash in their designated area mostly around their home.



FIGURE .3. Communities of Bir

4.3 Phenomenon of Trash Flows : The Neutral Community

1. The Open Illegal Landfills

The first phenomenon that propped up was the obvious visible landfills that the communities around had created for themselves to dump their trash. These landfills were small quarter of land which were surrounded by multiple cafe and resorts. The landfill contained mixed solid waste, coming from the surrounding settlements.

Around twice a week, these landfills would be visited by rag pickers to scavenge plastic and glass bottles out of the trash. These plastic bottles and glass bottles would be sold to a collector in return for a small amount of money, which sometime provides the livelihood of the ragpickers.

The five family members including Anwar Kumar (Figure 4), come to the colony road everyday during the season. They collect dry waste, plastic and bottle and boxes. They go to every shop and at the end of the day, they sell the plastic bottle to the Plastic Buyer Mr Kumar. The collector would send these back to the factories in near by city for recycling purpose.

These medium sized landfills , As seen in Figure.5., are around three in total distributed across the Bir colony road, however there are several small sized trash sectors which are shared by a collection of houses. The landfills will only grow and become larger as village becomes a larger attraction for the surrounding towns and cities. With transportation companies and social recognition, the village has been stated on a weekend destination, this will bring a larger influx of diverse tourists attracting more commercialisation and therefore larger landfills.

"No one has asked us to do this. We know that Mr. Kumar buys plastic bottles for some money. The other trash we collect we burn it everyday a little bit, otherwise this landfill will take up the whole place" - Anwar and His Wife, Construction Worked and Ragpicker



FIGURE 4. Shadowing Anwar and his family, who are selling the plastic bottles they collected during the day.



FIGURE 5. Anwar, burning some trash in the community made landfill



FIGURE 6.
BTS Worker at the
trash segregation
house



FIGURE 7.
BTS Worker at the
site where they burn
the rest of the trash

The Bir Tibetan Settlement president has appointed one worker who segregates the trash twice a week in the Dry Waste Segregation house (Figure .6.) built by the settlement office. The 200 homes under the settlement bring their dry trash to the segregation house twice a week. The worker removes the glass and plastic bottles from the trash, which get collected by the ragpickers every week. He dumps the rest of the trash into the small landfill made right next to the house, which comprises of plastics, tetra packs and sanitary waste. This waste is burnt every week. (Figure .7.)

The president has also encouraged the settlement to provide volunteers every month to clean up the settlement area.

"We have no other solution but to burn the trash, otherwise the whole place will stink and fill up eventually. We had sent several requests to the District government to provide us trash pick up service or landfill, however nothing has happened yet" - President, B.T.S. Office"

2. Rain channels or trash channels

The village Bir lies on the outskirts to the valley below, which gives it an inclining topography. The incline nature brings in abundant flows of water from rain and melting snow. While the incline helps the water to flow down to the valley, the fast and large flow can temporarily flood the homes. Along the village settlements, the locals had requested the government to build channels that will take the rain water down, so that their house would not be flooded.

Today long tributaries of rain channels exist alongside the line of homes of the locals of Bir. While walking around the valley you can hear the sounds of water gushing down into the channels; however, when you give a look into the water, the expectation of seeing clean mountain water is immediately drowned.

Over the years, the locals, cafes and restaurants have chosen to throw their trash into these rain channels (Figure .8.). The restaurants surround the main channel, which is the biggest in the village. Together the cafes and restaurants have employed two workers who collect the trash of the day and dump it into the channels. The workers have been taught to not tell where they throw trash or to not be seen throwing trash. This is due to direct complaints that go to the local government officers who can penalise them. The penalty for illegal dumping of trash at the moment is from 200 - 5000 rupees.



FIGURE 8.
Local lady,
through the trash
from her court-
yard into the Rain
Channel



FIGURE 9.
The current con-
dition of the rain
channel due to
dumping from all
the cafes

(3 - 65 euros). There had been a few times, complaints were lodged against constant dumping of garbage into the channels, the workers were warned to be penalised, however were not as the workers could not afford the penalty.

There had been a few times, complaints were lodged against constant dumping of garbage into the channels, the workers were warned to be penalised, however were not as the workers could not afford the penalty.

What seems to be the idea though is the perspective that the water will take the trash away, lightening the burden of trash treatment from its owners and shifting it to the receivers at the end of the channels. The out of sight out of mind phenomena was turning the surrounding stakeholder of the valley into neutralists. There was a lack of motivation and incentives towards showing responsibility. The focus for the surrounding commercial bodies was the business incentives however the meaningful treatment of trash required the availability of means and time devotion.

Several visitors come sip on tea at the Vairagi Cafe right in the middle of the Bir colony road, and right next to it is the largest rain channel of the road, which also contains large amounts of trash. Every morning fresh trash is seen in the channels. Through some of the walks during the day, no action of throwing trash into the channel was noticed, however a couple of fine visits later into the night brought out the culprits. The dark hour turned out to be a more comfortable hour for homes, cafes and restaurants to throw their trash into the channels.

"There is no other place to throw this, it is what it is. This is where everyone throws it not just me. Don't worry the water will take it away, there will be no trash tomorrow, clean as new" - Local cleaning her porch (Figure .9.)

"We can not fine the workers. There is no other way for them to throw trash so it is not fair and they cannot afford the fine. So we will try to instill fear in them." - Vikas Shukla, Sub Divisional Magistrate of Bir, Baijnath

"We have warned them to never throw trash in the channel again. However we know now they throw trash during midnight" Ranvijay Singh, Tourism andV Sport Head, Secretary to S.D.M

3. The smoky hour of the village

On an evening walk out for coffee, especially during twilight was small clouds and smell of burning throughout the village of Bir. Another famous and consistent phenomenon of trash treatment was burning of trash, especially by the locals of Bir. It is discovered in the later chapter that burning of trash was one of the oldest ways the village was treating trash. While interacting with the locals as they burnt their trash it was inferred that this was an activity encouraged by the neighbourhood and the local government in order to not litter the environment years before Bir grew in population. The small community burned a little trash, which was not said to have a large impact. However, today this may not be the case anymore.

Iron bins were installed in front of homes to dump trash, however locals took to burning trash in these iron bins on a daily basis. The locals proudly resort to burning of trash as their parents did before them. For them this is a way they are making the trash disappear rather than littering and taking away the essence of the surrounding. In their frame of knowledge, no one has imparted that burning of trash causes serious environmental issues and contributes to climate change.

"At this time madam, everyone is burning their trash, go up to the hill and look into the valley. The day is ending, it is time to clean up." - Local Shop Owner (Figure .10.)

Garden cafe is the hit list cafe to visit when someone comes to Bir. The clean rooms and green cafe brings in paragliders for a nap and fruit bowl. The owner of garden cafe is a social and easy going lady. The cafe tries its best to segregate trash. Very meticulously they separate plastic bottle and glass bottles for the collectors to take away. The kitchen decomposes or gives the leftovers to the dogs and cows. However there is still trash that is left over and the cafe strictly does not litter or fill the illegal landfills, which is why they resort to burning.

" I don't like my surroundings dirty, it will ruin my business. Look at all the trash thrown on the road, it makes the village look bad. There is no other solution but this" - Aunty, owner of Garden Cafe



FIGURE 10.
Local Lady
burning the
waste from her
tea shop



FIGURE 11.
Garden Cafe
owner burning
her extra trash
she cannot sell
or decompost

4.4. Alternative Interventions : The Activist Community

Through its sports and retreat culture the village of Bir attracts national and international travellers which set base in Bir. These intellectual migrants, enjoy the essence of the village and give back through their passionate efforts. The migrants over the years have noticed the waste management problems and find their aspirations crushed, as they hoped for a better living. Internationals feel empathy towards the problem, coming from well management systems.

4.4.1. Birth of Activism in Bir : Analysis of the Past

Through the years before Bir became a tourism and sport hotspot, it was a small agriculture town that was dependant on local produce for its livelihood. Most locals at the time could not afford packaged commercial food. The waste from the diet would go to cows or the fields as surplus. Plastic was not in stores or shops and most food was available through local produce. The rest was burnt and continues today as well apart from the other trash flow phenomenon discussion in the sections before.

In the year 2011, Deer Park Institute wrote to the local and state government to provide the village a suitable landfill and they were noticing the trash had no place to go. Their appeal was rejected by the government as no suitable land was available and told them to initiate alternative solutions. To this date Deer Park institute followed the laws of segregation and does awareness campaigns at grass root levels to teach about segregation at source and how that would litter the village much lesser. But the effect of this movement is not impact and the trash continues to grow.

In the year 2012, two Australian students Robin and Spierro studied under the Deer park Institute. They influenced and encouraged recycling and upcycling amongst their friends and smaller communities they interacted with. They introduced segregation in Deer Park Institute embarking upon a movement which still continues, as awareness campaigns in schools. Robin and Spierro also introduced some locals to creating Eco-Bricks which were strong enough to build a wall.

In 2015 for the first time in India Paragliding world Cup was held and the valley filled up with gliders and tourists from the surrounding cities. In the preparation of this event several restaurant and cafes were opened up to entertain the influx of tourists and sportsmen.

The second push of effort that was taken to to treat trash produced by the event was by the non profit organisation Dharmalaya. What was noticed was that there was mass littering taking place in the touristic spots as there were no bins and cleaners appointed. Dharmalaya collaborated with the local government propagating contribution of kilt bins made at the NGO for a small funding. The local government saw this as a great effort and helped install these bins for the tourists to use. What was noticed though in a week was those bins broke from a monkey rampage and since there were no collection of the trash, it all littered back into the village.

What followed was, the theft of the bins and the trash left behind. This was the last time the NGO tried to contribute to this problem, stating that effort from one side was not enough.

"We are not the only ones who can provide the solution, there has to be a proper system in place to which we can make a contribution, or effort from multiple bodies" - Teacher at Dharmalaya NGO"

Today, a suitable landfill site is in route to be chosen. The state government is in talks with the technology providers from Hyderabad to invest in a large incinerator for the several villages in and around Bir. While this raises the hopes of the local government and locals of Bir, the trash continues to pile on, knowing not exactly how and when will the solutions prosper.

However, smaller communities of Bir, activists like the certain cafe owners and NGOs continue to put in efforts to create meaningful lifestyles. For instance, using local produce to run the cafe rather than buying plastic bottles and tetra packaged products. Passionate and consistent visitors of the valley along with the activist cafes like Silver lining cafe started a project called the wall project, which was art installations of cement and eco bricks, this way the plastic bottles will be reused, however larger amounts would be dumped into the rain channels. All of these efforts are meaningful but have not been successful enough to create larger impact in the village.

4.4.2. The Current Interventions

There are many alternative ways communities have tried to cope with the waste management problem. Each of these efforts were collaborative efforts between the local panchayat/government or other bodies which were passionate about coping with this issue.

1. Bring in your trash : Collaboration with Local Government

The panchayat of Kyor, the end of the Bir Colony Road, after being influenced by local activist effort of creating eco bricks for surplus use in different project, instructed their entire section of the village to bring in their plastic bottles and plastic wrapper waste.

Instead of dumping the garbage the villagers got in the bags of plastic bottles and wrappers into the panchayat house. These bottles and wrappers were then given to the "Mahila Mandal" the women association of the panchayat to recycle and make products to sell further.

Beautiful baskets made by the Mahila Mandal and eco bricks are now used for art projects and selling in some cafes in Bir. This circular nature shows the like mindedness of the activist community and strong collaborative bonds between the community and the panchayat, local government and locals.

2. The Local Produce : Circular culture means less trash

Many cafe owners especially the ones in the sports and retreat community buy ingredients from local produce, depending on neighbours cow for milk and a friends farm for vegetable is better than buying packaged food and creating trash flows.

These activists have tried to spread the words through social media like instagram and facebook, however only a few people have been influenced by that. This is due to the big gap which is between one part of the village road and the other part of the village road

3. Awareness campaigns

Deer Park Institute follows a teaching and campaign model culture. Their segregation and ecology workshops bring a lot of people together. Deer Park Institute spreads awareness in all schools of Bir, as they believe in imparting meaningful ways of living to grassroots.

"A large part of this village is the youth and imparting knowledge and awareness to them is our target" - Praveen, Manager at Deer Park Institute

Deer park in collaboration with the Sarpanch/President of the local government started a Clean Bir Campaign day on 6th June every year. Every year, locals from all the village gather together and do workshops and cleanups of the village surroundings. The hustle motivates everyone to feel activate and responsible. However soon after the motivation subsides and things go back to the way they were.

"I go there every year. I am interested in learning new ways of making things from trash. I make art pieces and sell them at the shop. Everyone gets excited, but it all goes back to the same after a week, because we can't do everything right?" - Sangeeta, Staff at Vairagi Cafe - Artist for Vairagi Store



FIGURE 12.
The Wall Project : Made with ecobricks.



FIGURE 13.
Plastic and fabric baskets.



FIGURE 14.
Secretary of the local government. Tour of the collective room, where all locals put their trash.



FIGURE 15.
An ecobrick made out of one plastic bottle and around 80 plastic wrappers and bags

4.4.3. Impact of these Interventions

As the figure represents the shared landfills small and medium sized range from 4 - 5 along the colony road. The green spots represent, the recycling and upcycling of the trashflows. The smaller pale spots indicate the burning of small amounts of trash in front almost every house. What is clearly seen is that the activist efforts are lesser than the irresponsible trash flows on the Bir Colony Road. To understand deep rooted insights behind the cause of why there are no solutions and large impact deep analysis into the research has to be done. In the next chapter, systemic patterns behind the findings` will be addressed.

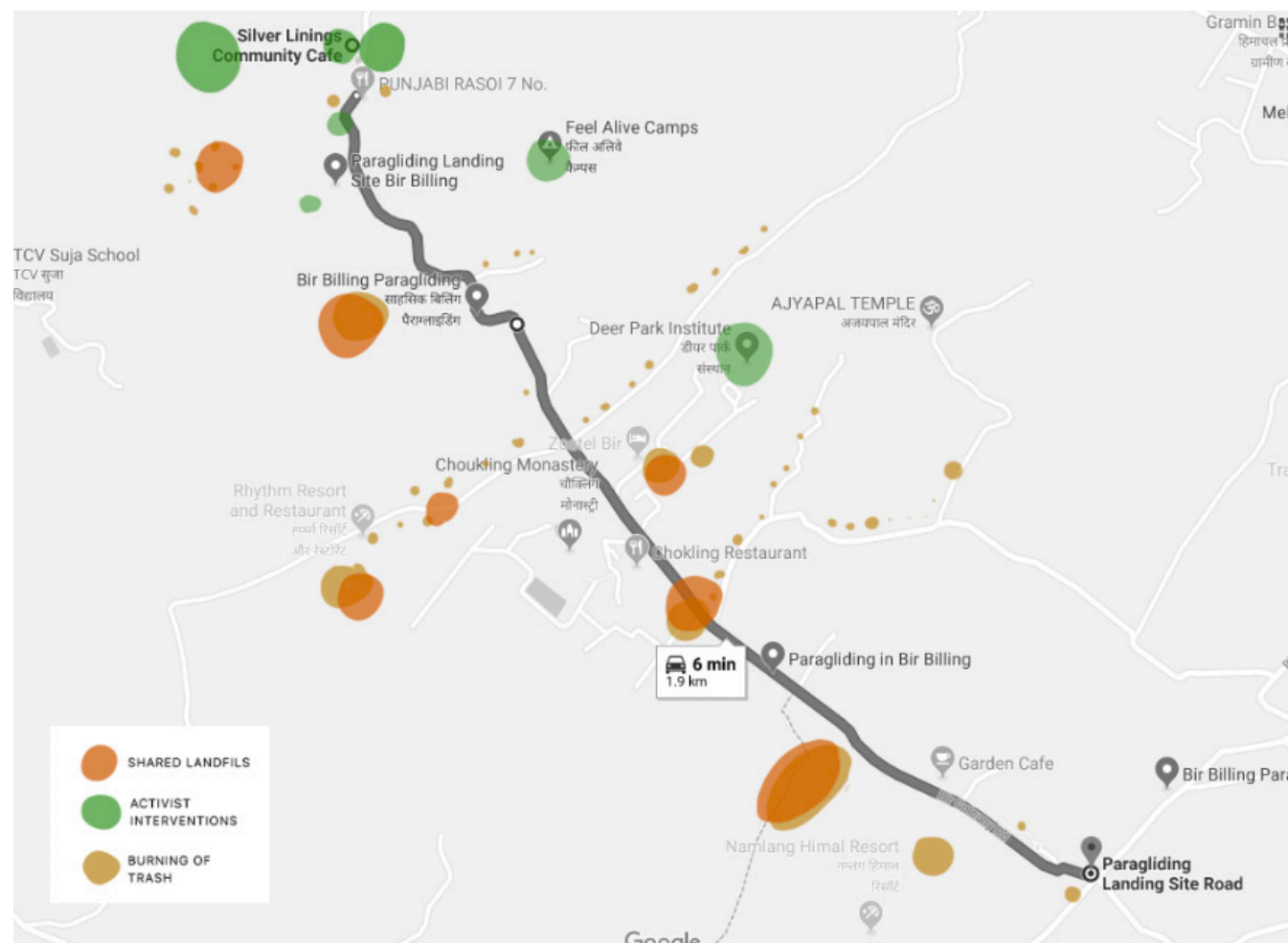


FIGURE 16. Impact spread of the activist interventions and the trash flow phenomenon

CHAPTER . V .

SYSTEMIC INSIGHTS ON ABSENCE OF SOLUTION & IMPACT

The research resulted in key questions which revolved around the exist of no proper solution and reason behind why there was no large impact from the interventions. The stage used here was analysis and synthesis. The methods used were Analysis boarding and behavior matrix.

5.1. Analysis of the data gathered

The research brought out two simple question which represented complex answers and issues behind. A thorough analysis and synthesis brought us to the systemic insights on the current problem in Bir. The overall analysis draws light on the gathered information and layer above that are patterns of stakeholders who affect the system

5.2. Why is there no solution yet from the government?

1. Shift of Focus

The district of Himachal Pradesh experienced a shift from being an agrarian economy to a tourism and sport based economy. Today most cafes and restaurant stand on lands owned by farmers. The economic shift from poor to rich was fast and the locals have no complaints as they live life of comfort and don't have to work hard in the fields. Sports and tourism gave the local youth of Bir several employment opportunities, paragliding business, cafes and art stores. Due to this economic shift, the focus has largely been on tourism and sport. This has shifted the focus from systems like waste management which is taking away the essence of the village.

"Everyone is really busy, there is so much to do now. We need more people to work on this and only this problem. I am at the moment, working on on an event, the President of India will visit us for paragliding competitions this year so everyone is busy." - Vikas Shukla, Sub Divisional Magistrate of Bir, Baijnath

The activist of the village have request for an allotment of a landfill for the past 8 years, however the process of finding a land took a long time, the activist facing rejection due to outskirts communities refusing to have a landfill around. This issue was parked aside and the task to find an alternative was replaced with the task to work on the upcoming paragliding world cup. Little was known that larger flows of trash came in after the world cup. After the world cup, an influx of tourists came in and the economy boomed. Every month there were new commercial bodies setting up station gathering permission and certification from the state government.

"With the tourists coming in, infrastructure and transportation are the key system we have to arrange as soon as possible" - Ranvijay Singh, Tourism and Sport Head, Secretary to S.D.M

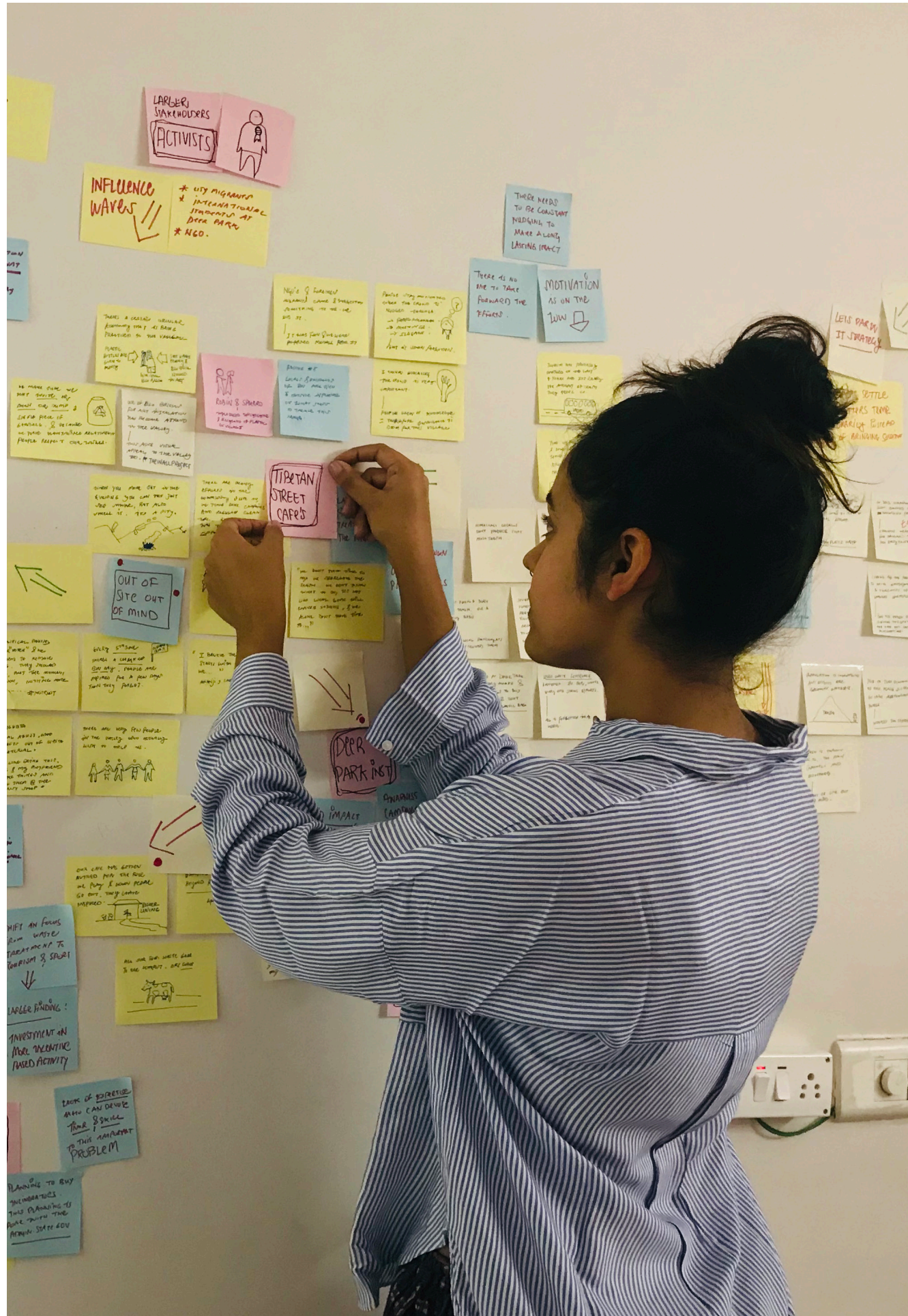


FIGURE 16. Board Mapping Part I.

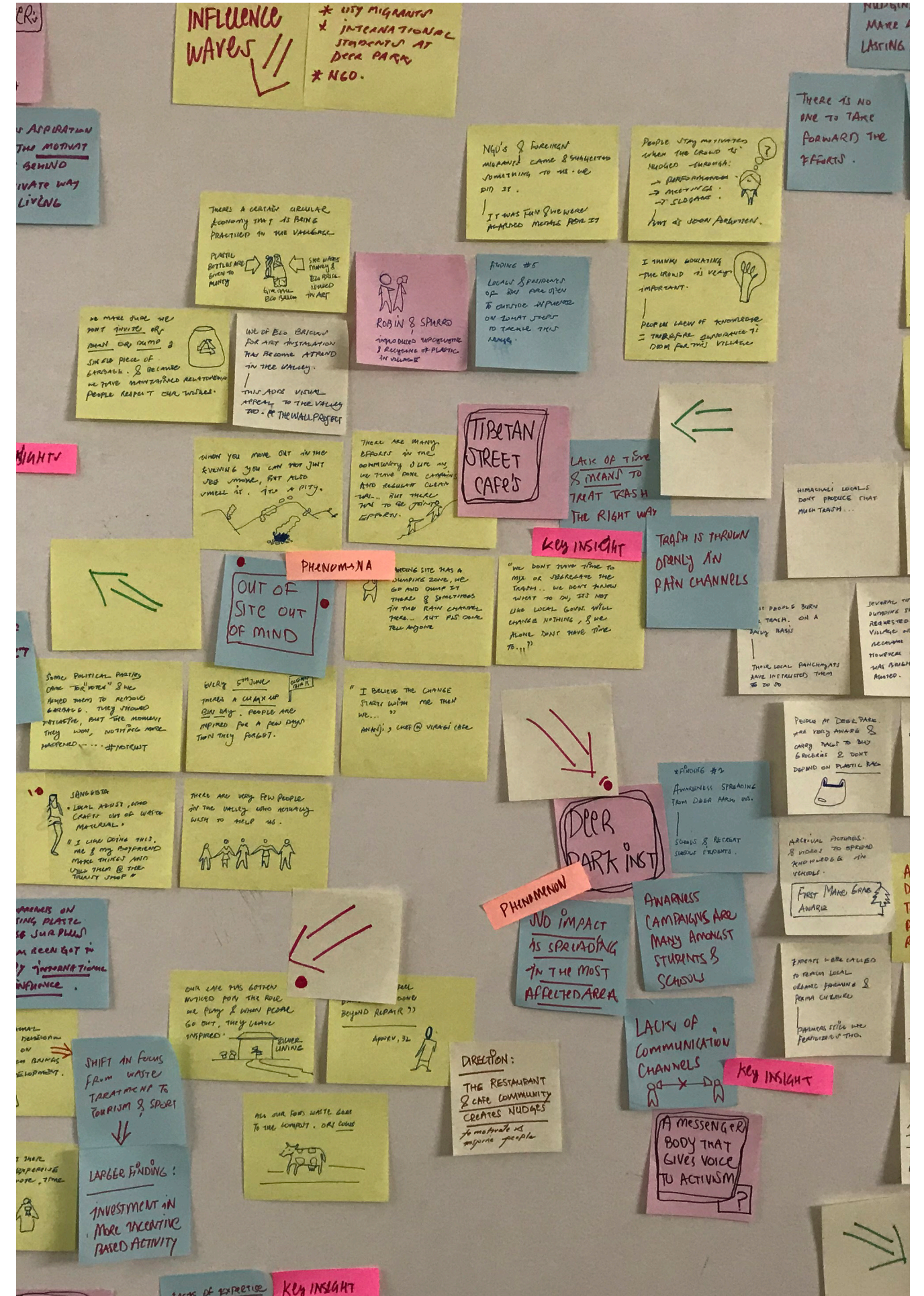


FIGURE 17. Board Mapping Part II

2. Lack of a knowledge body

The district and local government alone does not have enough influence and means to set up the contextual need of a waste management system. During the interactions with the governance stakeholders, there was a mention of set up incinerators for the village to give away all the trash they produce. This in a symptomatic way take away the trash however does not cater to the daily burning of trash by locals in their homes or the control on littering in the village by tourists and other stakeholders.

While there is a area being bought for a landfill, there are no plans for a service system which details out the plan of how will trash be removed from homes and commercial hotspots. There clearly is a lack of devoted and focused expertised which studies not just the treatment of trash but also the management of inflows and outflows of trash. Collaboration and knowledge gathering from expertise is not prevalent in the planning of waste management of the Village.

"The Special Area Planning Authority, has devoted a part of the land to an incinerator, we will be buying from Hyderabad. This should solve the problem" - Ranvijay Singh, Tourism and Sport Head, Secretary to S.D.M

There is also workshops at a larger level, where the central capital invited different villages and NGOs to present their ideas and efforts. Deer Park Institute sent their staff to show their efforts which were mainly in awareness of segregation. The workshop focused on choosing one village which was doing well and asked the other villages to follow. This while was a good exercise to bring communities together, did not result into efficient directions and way forwards. The need of right expertise and tools to guide such workshops is a necessity as the right audience and time has been invested.

"The workshop was funded and it was a week long, but there was no solution. It felt like they were just ticking a list of to dos. There were takeaways. But it was great to meet other communities and see their efforts. Truly inspiring." Trilok, Teacher at Deer Park Institute

There is also a lack of comprehensive policies. At the moment, no one is penalised of dumping garbage illegally. The residents and locals of village flow garbage blindly, knowing they will not be penalised. The policies for such a complex problem are few and not contextual or detailed. Temporary action based policies need to come up, until a permanent system is in place. And local expert with awareness of the audience needs to be a part of the policy process.

There is a lack of efficient tools that could empower and record voices. Due to this current activities that happen are not efficient enough. At the moment current village/ panchayat meetings happen twice a month. Complaints are recorded and the villagers are promised they will be sorted out. However skills and expertise required on working on solely communal efforts, need and aspirations don't exist. At the moment, the Panchayat President or Sarpanch addressed the need of the villages. The sarpanch is locally elected who can understand and be a voice to the locals. However, the Sarpanch selected does not qualify in understanding and communicating the patterns of waste management complains.

"The locals throw the trash wherever, it is hard to manage trash as already the government has not given any solution for this. We cannot do anything but try to clean the areas up. We just dig a hole and bury the trash so there are lesser complaints" - Raj Kumar, Sarpanch of Kyori Panchayat

5.3. Why is there not a larger impact of communal interventions?

1. Majority of the village are Neutralists

Neutralists as mentioned in the chapters before are the stakeholder communities in the valley who dump trash irresponsibly with no empathy or annoyance towards either the activists or the government entities. The non existence of a permanent waste management system and the old tradition of burning trash gave birth to Neutralists. These locals, farmers and commercial businesses, are dump trash into the rain channels receiving the satisfaction of shift of burden, as the rain channels take away the trash into the valley.

While this is an illegal way of treating trash, no penalties have been charged or actions have been taken against the locals as there is no prevalent alternative to this action. This has given encouragement to the attitude of being neutral or rather blind towards the problem.

While there is a larger incentive for the neutralists in focusing on their business and farming to earn a good living, there are barely any incentive to focus on a problem like waste management. The lack of means from the government entities and motivation from lack of incentives makes more and more neutralists in the village and being a part of activist movements is time consuming, as they find it easier to through the trash in the channels.

2. No communication channels or platforms

Several modern interventions are used by a minority of activists in the village. These interventions are practiced on small scale by a few member of cafes and the village. As Deer Park promotes their awareness campaigns there is a knowledge bank of information that can offered by the Owner of Silver Lining Cafe about reuse of plastic into art.

This is a lack of communication channels that separate and isolate these activist groups rather than bringing them together to become a larger and more impactful entity.

While physically there is a short distance between each of these entities, there are busy schedules which distance them, therefore existence of a social network or a communication channel would help these activist entities to synchronize their motives and exchange skills and knowledge for a larger impact.

"I have made a deal with Apoorv (owner of Silver Lining Cafe), i will be providing him all my plastic bottles and he will sell eco bricks back to me. This way i am going to build my cafes amphitheater" - Gurpreet Dhindsa, Paragliding Coach and Blue Umbrella Cafe Owner

CHAPTER . VI .

PROTOTYPING : GIVING POWER TO THE ACTIVISTS

The activists are the minors of the village but contribute majorly to alternative ways of flowing trash. The insights which were formed in the last chapter revolved around why there was no solution and impact out of the current intervention. The activists suggest activism rather than a particular solution. They suggest nudging not just their community, but the neutral, education and the government. Activist proved that were only a speck of contribution and what was required was a system to empower them or anyone else in the community.

6.1. Prototype

Co-design work shop was one of the ideas that I came up with while ideating in general over the key insights which came out of the findings. The intent of doign this prototype was to generate reinforcing insights and directions through the raw activism in the community

6.2. Participatory Co Design Workshop

One of the many insights in the last chapter revolved around opening the communication channels between the activists of the community to create larger impacts. For this a co-design workshop was organised. The idea was to first see how different activists behaved in a communal and social setting and second purpose was to role play and trigger the users to come up with solutions for scenarios based on key insights.

The co-design workshop had either participants, each of whom played an important passionate role in turning the workshop into an overwhelming platform of ideas. The eight members were asked to divide into two groups and they were suppose to choose roles from a bowl, which they would be playing. Then according to the role batch they were given their case. Each case was to be solved by them, keeping their roles in mind.

The key insights in form of cases which were focused on were irresponsible trash dumping from neutralists and creating a collaborative knowledge body to plan for upcoming paragliding competition event. These cases required the roles player of the workshop to plan actively but in a short time frame. The results of the roleplay part of the workshop were as expected not specific to the problem but broad, however this helped understand the psychology of activities and how the community functioned.

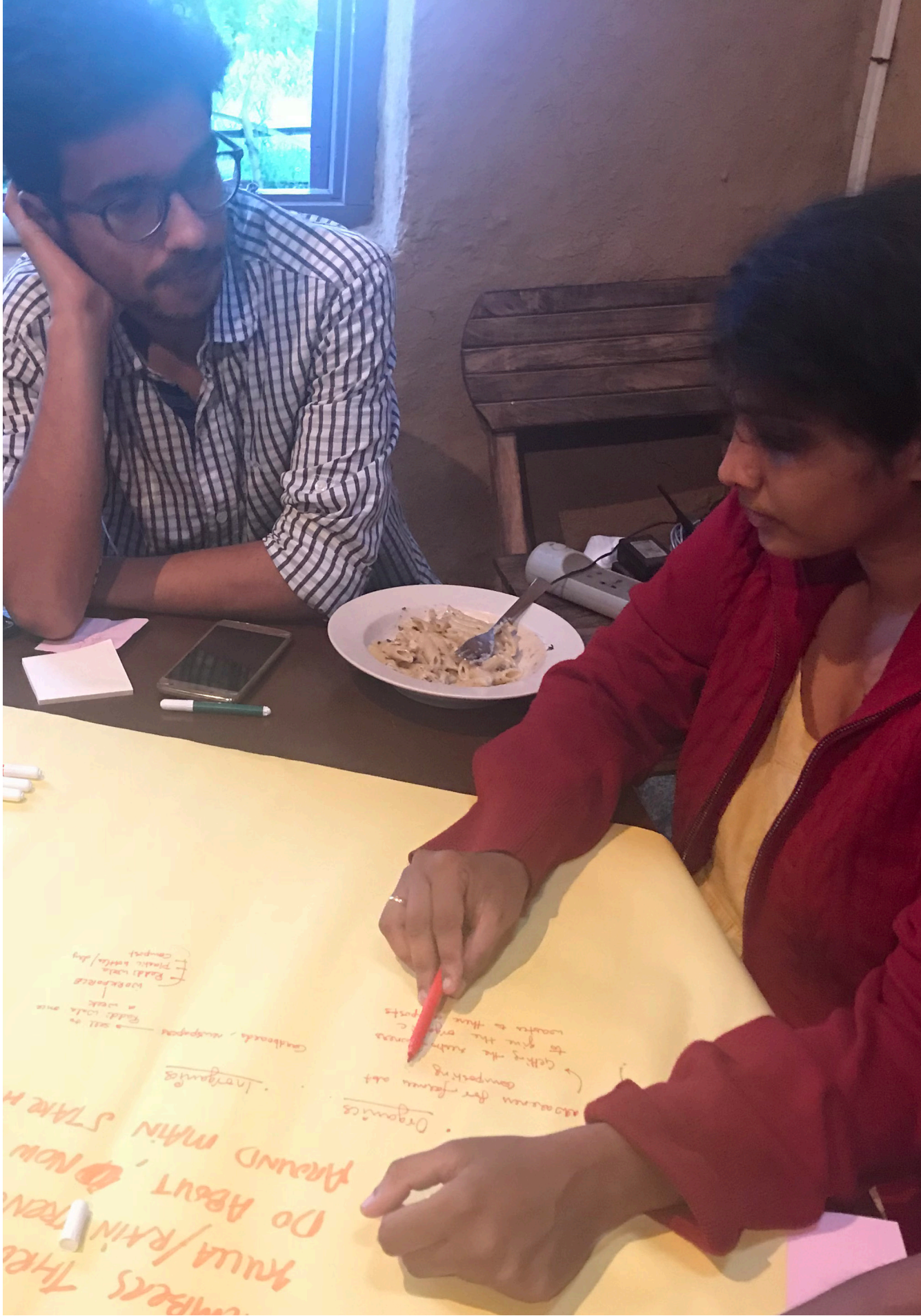


FIGURE 19. Case study group, coming up with a holistic way of campaigning

6.3. Outcomes of the workshop

The solutions came out of the eight different perspectives which were the eight different roles given to the participants of the workshop, backed with the activist approach they came with. The solutions suggested were systemic and multi directional not one directional. This workshop suggested lack of good solutions until there is efficient collaboration between different stakeholders. For instance, for the case of irresponsible dumping by neutralists, the group suggested social rating system to incentivise the task of trash treatment, however this social rating system would be backed by the local government to make it more effective and on a larger platform. Here there is a suggestion of collaboration with the government entity.

There were small suggestions for larger changes like, free refilling of water in the cafes. And owning a refiller would give a social rating to the cafe owner which would encourage others to do the same which in turn would avoid the usage of plastic bottles. These refiller would be provided at a budgeted rate by the filter companies to market their product. This concept showed the prevalence of collaboration with outside entities. By this workshop there came an understanding that activism therefore are not promoting local communities but nudging all the stakeholders.

A direction of local Marshal Body which would be by the authorities for social or other incentives and they would encourage the rest of their peers and locals to encourage and maintain a circular economy refraining the communities to burn trash. The authorities at the same time would arrange for trash to be picked up door to door by the people with strict segregation standards. They would make sure they keep in touch with the marshal on a regular basis to be efficient collaborators.

Encouraging a circular way of living rather than depending on large flows of plastic and packaged good was a consistent suggestion. Empowering the farmers, local and organic produce in return of money or skills was preferred. However, if there was an inflow of packaged good, then creating policies with wholesalers and factories to take back packages and plastics with incentives in order to maintain the essence of the valley and avoid littering in the first place.

6.4. Reinforcing Insight : Why was prototyping the cementing stage?

The research got out insights which were framed for two categories. One context was the government context and another was communal activists context. Solutions in this case would be look at separately, focusing the design directions for activists first and then government or visa versa.

This workshop cemented the finding that, for systemic insights a systemic solution with systemic and collaborative design direction were required. While it was convenient to set direction for each stakeholder separately, it was actually impossible to do so. In order to make a design direction work efficiently involvement and collaboration of the other stakeholders created a larger impact and a more solid foundation.

If we backcasted at why current intervention by the communities did not work on a larger scale, it was because of lack of communication of interventions, however it was also due to lack of presence of the different stakeholder collaborations which created a gap between stakeholder aspirations. For a efficient waste management system, there first needs to be efficient synchronization of goals and aspirations.

CHAPTER . VII .

DESIGN IMPLICATIONS FOR EVOLVING PATHWAYS

A synchronised sound waste production and management system exists in the village. The village is circular and different entities and stakeholders offer different incentives to activate people, in order to contribute to the emergent system. Body of marshals, which represent the community are employed by the local government who work in collaboration with the government and community. A knowledge entity exists that supplies curriculum to the education institutes and workshop culture with the NGOs and other private bodies. This system has stakeholder who all are synchronised with the same aspirations and motives.

7.1. Conclusion

Trash is openly dumped along the roads and the rain channels of Bir due to the non-existence of a waste management system and the unawareness of implications of open trash flows in the village.

The government leans more towards Economic development through tourism and sports, shifting the focus from waste management problem, creating open trash flows, which stink and are visually not appealing. What adds to this shift of focus is the lack of expertise which can contribute to the problem and a knowledge body that entirely works on this agenda. These missing sources in the system create a delay to an already ignored or set aside issue. What is also important to not forget is the laid back Indian attitude, which believes someone will come save us.

Several small scale intervention exists which effect tiny speck of the large problem, while a waste management system seized to exist, but none of these qualify to extend a large impact amidst the village to change the phenomenon that exist.

The disconnect formed due to the incentivisation from business has lead to a neutralist attitude towards everything else, especially the problems of waste management which give no direct channels of incentives. The neutralist fail to see a large incentive of living a sound and healthy life through a clean system due to unawareness and ignorance.

While the urgency of a waste management system prevails in the village, there is also an emergence of shift in attitude of the locals to push pace for radical change. While technology, for instance incinerators could take the trash away, it affects the environment through its affluence and a sound consumption and trash flow pattern does not exist.

The motive of being not just free of trash on the road, but be a sound and responsible village will require more meaningful systemic interventions for multiple stakeholders. In order to nudge the community there needs to be an umbrella of activism that consistently motives locals to live soundly, while a legal waste management system exists.

The current interventions fail to create large impact as there is minimum stakeholder involvement and communication which means, there is no synchronization of aspirations in the community and governance system.

8.2. Stakeholder Typology

For a complex problem like this is is important to activate stakeholders rather than singular users, especially when the village is about communities rather than users. With a diverse set of communities in Bir that is not difficult. It is important to first throw light on the typology of stakeholder and then map them in order to match them.

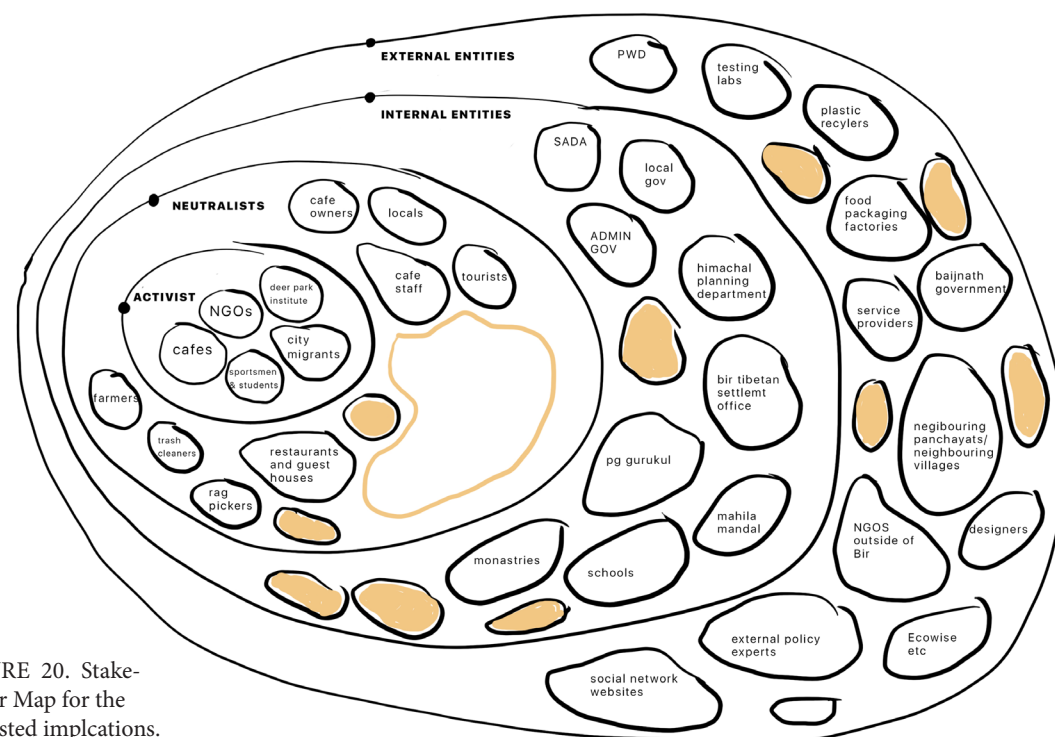


FIGURE 20. Stakeholder Map for the suggested implications.

8.2.1. Design Directions for Internal and external Entities

In order for the community to function and behave as responsible and active stakeholders of the system, they needed to be provided with alternatives and right means. The key insights lead the research to these design pathways for the government.

1. A New Department for Waste Management

A new department solely focused on growth of waste management system, which directly collaborates with a body of activists and external entities and indirectly empowers neutralists by promoting activist interventions. This is a body knowledge that has expertise in the issue field.

The waste management depart must have a Chief management officer, who works with numerous expertise hired with him. Collaborative bodies like external policy expert and technology labs which exchange resources with him for contextual village needs. These collaboration come in help as there is distributed work and time management. The Waste Management department recommends interventions to Internal Entities like Special Area Planning Authority and Administrative government in Baijnath, who give a go ahead to the intervention rather than plan them at their place



FIGURE 21. Waste Management department and Chief W.M. Officer/Chief Sustainability Officer

2. Policy designing workshops

At the moment policy reform are made by the state government, but for waste management issues they are implemented by urban development department, due to this there's a gap in communication and intent synchronization. Policies are not reformed and made keeping in mind the types of communities and their lifestyle. To be able to understand policies, the format needs to be local and contextual.

While policy format can change, what can make policy implementation easier is important representatives being a part of these policy formation meetings. At the moment policies can be requested top down and down top both, either from the state level or from the panchayat level. Panchayat voices the problems and needs of the locals. This means a representation should be present in the policy detailing workshops and giving contextual suggestion on how his locals will abide and understand them.



FIGURE 22. Co Design workshops for policy making.

The same way, activists like cafe owners, should have a trustworthy and responsible representative who is a part of the process. These involvements start to synchronise the goals and missions of different stakeholders, leaving no gap in understanding and following norms.

3. Impacting Education : Including waste management in curriculum

One of the reasons why, the neutralists turn into one is because they lack the knowledge and awareness of implications of visible free flowing trash in the village. If educational institute took curriculum and activities as a way to engage students in understanding why trash should flow safely and in order they will not be ignorant towards these phenomenon.

Texts book are one aspect of the curriculum, however being a part of activities like learning segregation and recycling through collaborations with Deer Park Institute is a fun way of understanding a system and the communal goals. The children and youth are an equal part of the stakes in a community. Incentives like rating and certification should be promoted to enthusiastic youth which will help them hone opportunities in the future.



FIGURE 23. Waste management at grassroots level, in curriculum and activity based learning

8.2.2. Design Directions for the Activists and Neutralists

In order to activate neutralists of the village, the activist needed a platform and a voice to spread their impact and activism. The neutralists worked on incentives rather than individual or communal motivation. The key insights about the neutralists and activists helped chart of two design directions which would nudge the communities to contribute and be a part of a sound system

1. Building a Social Communication Channel

To give light to the many interventions that the community can benefit from, a communication channel which helps exchange ideas, efforts and skills will nudge the community better in order to create larger impact.

At the moment, while one cafe owner creates a circular economy with his neighbours, cafes on another side of the village cannot enjoy the perk of the system as, the knowledge and communication flow are not prevalent. The communication channel/dashboard will bring together not just the straight 2 kilometer road into one screen, but also the entire village of bir and the Internal entities, so they can keep themselves up to date with communal interventions. The neutralists who are shy to approach activism, can reach out to the communication channel for contribution.



FIGURE 24. A Portal to spread your voice and share knowledge.

Marshal collaborative body elects representatives to collaborate and act as messenger to the internal and external entities and representatives to their communities. This employment opportunity not only creates a sense of responsibility in different communities but also nudges the neutralists to take up responsibility for the different incentives like perks and social ratings. It should also create a sense of security and comfort amongst the communities as a member of their community can favor and voice their needs.

8.2.3. Journeys and System Map

To elaborate a few scenarios of the journey a small leaflet of journeyes and System map is made. When you flip the next page you can see the filed leaflets.



FIGURE 24. Marshals of the Local Government, representing their communities.

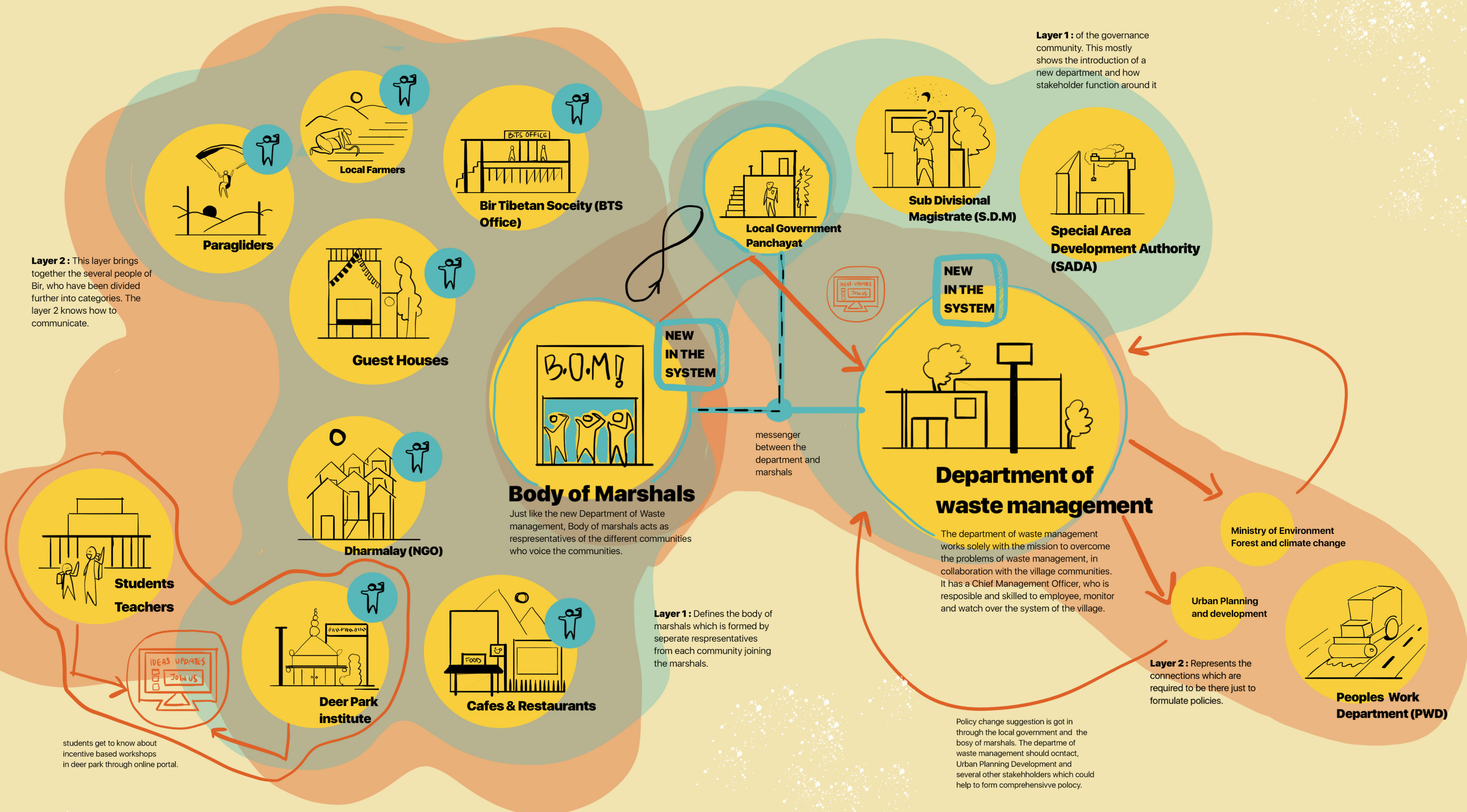
Through their presence certain interventions can be taken and funded with collaborations and connection with the external entities. This creates a fluid experience with synchronised goals.

2. Marshal Collaborative Body

The power play takes away motivation and rigour from the local communities to make an impact in and around themselves. The easy going and inefficient attitude of the government in Bir, gave birth to neutralists. Not only did they find no incentive to contribute to the system they also escaped the system by breaking rules knowing that they will not be penalised.

Layer 2 : This layer brings together the several people of Bir, who have been divided further into categories. The layer 2 knows how to communicate.

Layer 1 : of the governance community. This mostly shows the introduction of a new department and how stakeholder function around it



Service System Journey Map

Himalayan Paradise or Dumpster?

Shreya Kumar, Masters Thesis 2018

This service system, maps the new channels of communication in synchronisation between the stakeholders of Bir, Himachal Pradesh. It also demonstrates the flow of skills/knowledge exchange between the community and how they benefit form it. While there are internal stakeholders of the village, there are external stakeholders that join the system, making it more strengthened.

JOURNEY

Himalayan Paradise or Dumpster?

Shreya Kumar, Masters Thesis 2018

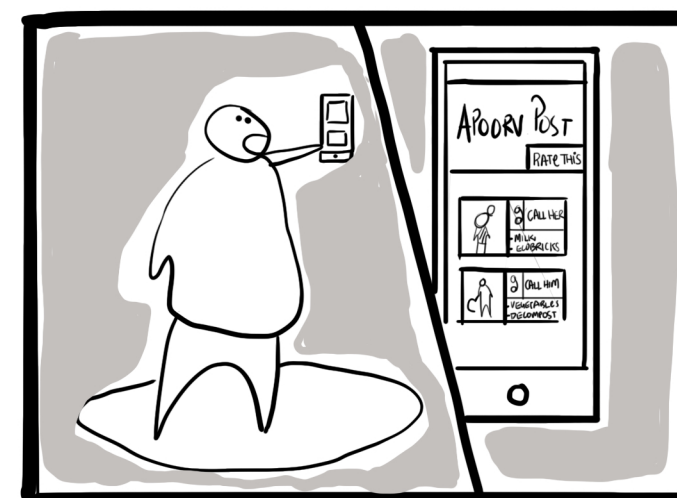
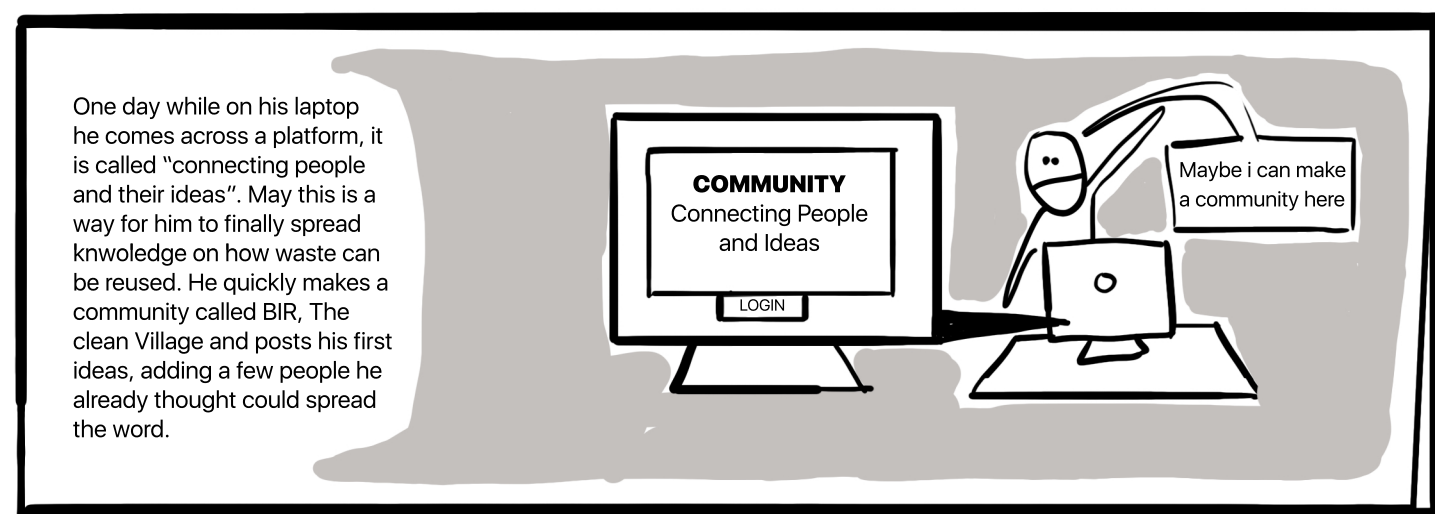
CASE

This case targets the level of communication in Bir. Through this journey, we try to look at future ways of tackling the communication Problem, this is one example that helps understand deeply a single level of a large communication system.

PERSONA AND SCENARIO

Apoorv is a 32 year old activist who moved to Bir to open a cafe called silver lining. He moved to Bir after 8 years of studying and working in New York City, USA. His aspirations to move to Bir, were to get back to nature and his roots and his love for the sport paragliding. When he moved he realised the town is not as quaint and fresh as he has imagine. When walks through the village, he can smell the trash burning, he can see the trash in the rain channels and on the roads. He personally is aware of several ways of dealing with his trash, however he does not know how to spread the word in the village about it.

Currently he tries to recycling the plastics into bricks which creates beautiful walls in form of Art and he tries to also remain circular by buying milk and food directly from the farm, this also connects him to some people in the village.



Anand is a cafe manager at vairagi cafe, and finds Apoorv's post. While he is shocked because his cafe produces a huge amount of waste he is also hopeful that some solutions can come up. He shows this to cafe owner, and they decide to call Apoorv's worker "aunty", and ask her to give us local milk everyday, which would cut down all the tetra packs of their cafe. They also decide to provide their organic food waste to the farmer as surplus.

In this way, aunty found another contact and resource to do extra earning and contribute to her family and the farmer did not have to depend on fertilizers. What is better is that this time, vairagi cafe did not have a lot of garbage left to throw into the rain channels.

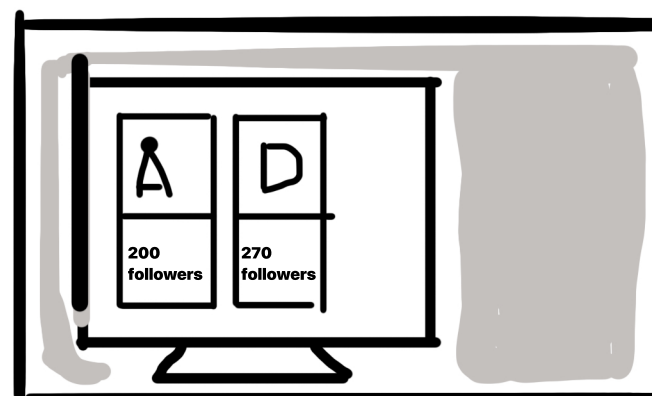
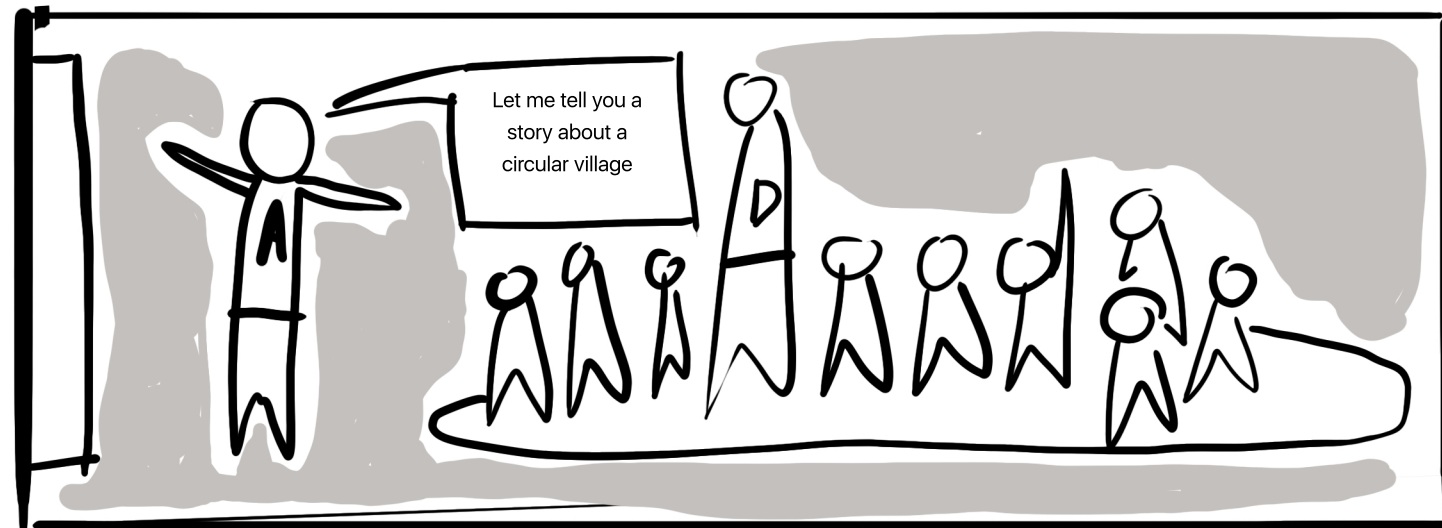


14 Members
used your idea
40 Members
Appreciated your project
1 message



Deer park invites him to do a workshop of circular living with kids and the outcome will be certificates for them. He gets excited to share his knowledge about this and gets ready to give YES as a response. This will be beneficial for the kids and for networking. The kids feel activated by incentives and support with deer park would help him spread impact.

Both deer park and Apoorv were noticed on the community portal and in the village for their efforts. The rating on the community portal spread a rigour amongst many members of the community, wanting to be a part of this incentivised system.



THE BEGINING

8.3. Implications for a Designer

In order to gather the most insightful project, it is first important to trash a solution based approach. Agile working and prototyping was thought to be relevant on a narrowed down context, however with a complex problem set in a complex economy it is important to first only understand. Bringing out deep rooted and invisible patterns stick in a fuzzy network will be more fruitful for the community and stakeholders, and proved to be so. In many conversation with the community, the realisation of a certain phenomenon, for instance, being neutralist versus activist, changed the perspective of many and gave light of change in their opinions.

I would through my experience highly recommend working in a group on such a project. This was a complex problem, and for such a timeline group work would have been more beneficial. Designers can play large and diverse roles within one project. Waste management problem is a product service system and sustainability issue. A parallel approach of quantitative analysis, design for policy and co design would have bound this project in a very impactful way.

However, with my timeline, the approach I took in the end proved to be fruitful and full of learning for a masters thesis. It provided enough material of understanding and complexity to apply the knowledge i had received in my studies. There was also more that could have been done, for example deep analysis through co design tools, however sticking to a crisper approach in the short time was more efficient.

I chose this project, because I had the rigour and passion to contribute to a developing country where i grew up. While the process was difficult and sometimes very frustrating due to delays and constant problems faced from the different stakeholders i spoke to, it was very insightful and learning experience.

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